

K-Ar Geochronology Results for the Mount Pisgah Quadrangle, Utah

by

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INTRODUCTION

This Open-File Report makes available raw analytical data from laboratory procedures completed to determine the age of a rock sample collected during geologic investigations funded or partially supported by the Utah Geological Survey (UGS). Table 1 provides the sample identification and location for the age data. The references listed in table 1 generally provide additional information such as sample location, geologic setting, and significance or interpretation of the sample in the context of the area where it was collected. This report was prepared by Krueger Enterprises, Inc., Geochron Laboratories Division in 1995 under contract to the UGS. These data are highly technical in nature and proper interpretation requires considerable training in the applicable geochronologic techniques.

Table 1. Sample ID and location.

Sample ID	7.5' quadrangle	UTM27-12 E	UTM27-12 N	References
tuffaceous sandstone (F)	Mount Pisgah	425989	4603425	Smith, 1997; Oaks and others, 1999; King and others, 2018
		Latitude NAD83 (°N)	Longitude NAD83 (°W)	
		41.5809381	111.8886102	same

Notes:

This is sample F in Smith (1997) table 3 and Oaks and others (1999) table 1, with the location reported as latitude 41° 34.86'N, longitude 111° 53.27'W. (presumably NAD27). This location is converted to UTM NAD27 and Lat/Long NAD83 above.

We prefer the location given by the coordinates in table 1 over the sample location plotted on the geologic map by Smith (1997, plate 1), which is farther from the exposures in the roadcut.

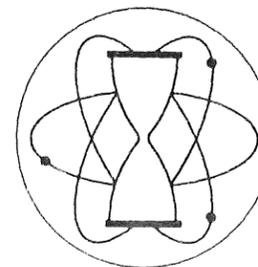
Data are also presented as table 1 in King and others (2018).

REFERENCES

- King, J.K., Solomon, B.J., and Oaks R.J., Jr., 2018, Interim geologic map of the Mount Pisgah quadrangle, Box Elder and Cache Counties, Utah: Utah Geological Survey Open-File Report 688, 2 plates, 29 p., scale 1:24,000, <https://doi.org/10.34191/OFR-688>.
- Oaks, R.Q., Jr., Smith, K.A., Janecke, S.U., Perkins, M.E., and Nash, W.P., 1999, Stratigraphy and tectonics of Tertiary strata of southern Cache Valley, north-central Utah, *in* Spangler, L.E., and Allen, C.J., editors, Geology of northern Utah and vicinity: Utah Geological Association Publication 27, p. 71-110.
- Smith, K.A., 1997, Stratigraphy, geochronology, and tectonics of the Salt Lake Formation (Tertiary) of southern Cache Valley, Utah: Logan, Utah State University, M.S. thesis, 245 p., 3 plates.

APPENDIX

Analytical Data for Sample Tuffaceous Sandstone (F)



GEOCHRON LABORATORIES a division of
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POTASSIUM-ARGON AGE DETERMINATIONREPORT OF ANALYTICAL WORK

Our Sample No. A-10934

Date Received: 1/17/95

Your Reference: Letter of 1/11/95

Date Reported: 3/17/95

Submitted By: Kristine A. Smith
 Dept. of Geology
 Utah State Univ.
 Logan, UT 84322-4505

Sample Description & Locality: Sample # tuffaceous sandstone

Material Analyzed: Hornblende concentrate, -80/+200 mesh.
 Treated with dilute HF and HNO₃.

⁴⁰Ar/⁴⁰K = .002599

AGE = 44.2 +/- 1.7 M.Y.

Argon Analyses:

⁴⁰ Ar, ppm	⁴⁰ Ar/Total ⁴⁰ Ar	Ave. ⁴⁰ Ar, ppm
.001861	.382	.001826
.001787	.510	
.001831	.413	

Potassium Analyses:

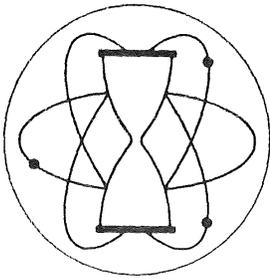
% K	Ave. % K	⁴⁰ K, ppm
0.582	0.589	0.703
0.596		

Constants Used:

$\lambda_p = 4.962 \times 10^{-10}/\text{year}$
 $(\lambda_o + \lambda'_o) = 0.581 \times 10^{-10}/\text{year}$
 $^{40}\text{K}/\text{K} = 1.193 \times 10^{-4} \text{ g/g}$

$$\text{AGE} = \frac{1}{\lambda_p + (\lambda_o + \lambda'_o)} \ln \left[\frac{\lambda_p + (\lambda_o + \lambda'_o)}{(\lambda_o + \lambda'_o)} \times \frac{^{40}\text{Ar}}{^{40}\text{K}} + 1 \right]$$

Note: ⁴⁰Ar refers to radiogenic ⁴⁰Ar.
 M.Y. refers to millions of years.



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POTASSIUM-ARGON AGE DETERMINATION

REPORT OF ANALYTICAL WORK

Our Sample No. B-10934

Date Received: 1/17/95

Your Reference: Letter of 1/11/95

Date Reported: 3/17/95

Submitted By: Kristine A. Smith
 Dept. of Geology
 Utah State Univ.
 Logan, UT 84322-4505

Sample Description & Locality: Sample # tuffaceous sandstone

Material Analyzed: Biotite concentrate, -80/+200 mesh.

$^{40}\text{Ar}/^{40}\text{K} = .002862$

AGE = 48.6 +/- 1.3 M.Y.

Argon Analyses:

^{40}Ar , ppm	$^{40}\text{Ar}/\text{Total } ^{40}\text{Ar}$	Ave. ^{40}Ar , ppm
.01308	.417	.01299
.01291	.406	

Potassium Analyses:

% K	Ave. % K	^{40}K , ppm
3.844	3.807	4.541
3.769		

Constants Used:

$\lambda_p = 4.962 \times 10^{-10}/\text{year}$
 $(\lambda_o + \lambda'_o) = 0.581 \times 10^{-10}/\text{year}$
 $^{40}\text{K}/\text{K} = 1.193 \times 10^{-4} \text{ g/g}$

$$\text{AGE} = \frac{1}{\lambda_p + (\lambda_o + \lambda'_o)} \ln \left[\frac{\lambda_p + (\lambda_o + \lambda'_o)}{(\lambda_o + \lambda'_o)} \times \frac{^{40}\text{Ar}}{^{40}\text{K}} + 1 \right]$$

Note: ^{40}Ar refers to radiogenic ^{40}Ar .
 M.Y. refers to millions of years.